

We claim:

1           1.     A surgical probe, comprising:  
2                 a shaft defining a distal end and a proximal end;  
3                 a plurality of energy transmission devices supported on the  
4 shaft; and  
5                 a tissue cooling apparatus supported on the shaft including an  
6 outer member positioned about the plurality of energy transmission devices  
7 such that a continuous fluid transmission space is defined therebetween  
8 having an inlet and an outlet.

1           2.     A surgical probe as claimed in claim 1, wherein the shaft  
2 comprises a relatively short shaft.

1           3.     A surgical device as claimed in claim 2, wherein at least a  
2 portion of the relatively short shaft is malleable.

1           4.     A surgical device as claimed in claim 1, wherein the plurality of  
2 energy transmission devices comprises a plurality of electrodes.

1           5.     A surgical probe as claimed in claim 1, wherein the tissue  
2 cooling apparatus comprises a porous structure.

1           6.     A surgical probe as claimed in claim 5, wherein the porous  
2 structure comprises a microporous structure.

1           7.     A surgical probe as claimed in claim 1, wherein the fluid  
2 transmission space defines a substantially constant cross-sectional area  
3 between the inlet and the outlet.

1           8.     A surgical probe as claimed in claim 8, wherein the fluid  
2 transmission space defines a substantially annular shape.

1           9.     A surgical probe as claimed in claim 1, further comprising:  
2                 a fluid supply line associated with the inlet and supported on the  
3 exterior of the shaft.

1           10.    A tissue cooling apparatus for use with an electrophysiology  
2 apparatus including a shaft and at least one energy transmission device  
3 supported on the shaft, the tissue cooling apparatus comprising:

4                 a base member defining an interior lumen that is slightly larger  
5 than the electrophysiology apparatus shaft and a proximal opening adapted to  
6 receive the electrophysiology apparatus shaft, the base member including a  
7 fluid lumen port in fluid communication with the interior lumen;

8                 a tubular member, associated with the base member, defining a  
9 proximal end, a distal end, an interior lumen substantially aligned with the  
10 base member interior lumen and at least one aperture located between the  
11 proximal and distal ends; and

12                an outer member supported on the tubular member such that a  
13 fluid transmission space is defined between the outer member and the tubular  
14 member.

1           11.    A tissue cooling apparatus as claimed in claim 10, wherein the  
2 outer member defines a distal end, the tissue cooling apparatus further  
3 comprising:

4                 a fluid lumen port associated with at least one of the distal end  
5 of the tubular member and the distal end of the outer member.

1           12.    A tissue cooling apparatus as claimed in claim 10, wherein the  
2 base member interior lumen includes a seal adapted to engage the  
3 electrophysiology apparatus shaft.

1           13.    A tissue cooling apparatus as claimed in claim 10, wherein the  
2 tubular member comprises a flexible tubular member.



1           21. A tissue cooling apparatus as claimed in claim 18, wherein the  
2 fluid transfer assembly includes a tubular member including a plurality of  
3 apertures , the plurality of apertures being located within the outer member.

1           22. A tissue cooling apparatus as claimed in claim 18, wherein the  
2 tubular member is secured to the base member and the outer member is  
3 supported on the tubular member.

1           23. A tissue cooling apparatus for use with an electrophysiology  
2 apparatus including a shaft and at least one energy transmission device  
3 supported on a distal portion of the shaft, the tissue cooling apparatus  
4 comprising:

5                   a fluid transfer assembly defining an inlet, an outlet, and a size  
6 and shape sufficient to receive the distal portion of the electrophysiology  
7 apparatus shaft in such a manner that a fluid transmission space is defined  
8 between the electrophysiology apparatus shaft and the outer member; and

9                   mounting means for removably mounting the fluid transfer  
10 assembly onto the electrophysiology apparatus shaft.

1           24. A tissue cooling apparatus as claimed in claim 23, further  
2 comprising:

3                   sealing means for forming a seal between the mounting means  
4 and the electrophysiology apparatus shaft.

1           25. A tissue cooling apparatus as claimed in claim 18, wherein the  
2 fluid transfer assembly comprises a porous structure.

1           26. A tissue cooling apparatus as claimed in claim 19, wherein the  
2 porous structure comprises a microporous structure.

1           27. A tissue cooling apparatus as claimed in claim 23, further  
2 comprising:

- 3                    sealing means for forming a seal between the mounting means
- 4                    and the electrophysiology apparatus shaft.